

POLICY PAPER

PUBLIC MEDIA, SPECTRUM POLICY, AND RETHINKING PUBLIC INTEREST OBLIGATIONS FOR THE 21ST CENTURY

BY BENJAMIN LENNETT, TOM GLAISYER AND SASCHA D. MEINRATH¹

JUNE 2012

SUPPORTED BY A GRANT FROM THE OPEN SOCIETY FOUNDATIONS

Executive Summary

In this paper we consider reforms and innovations in spectrum policy that would enable and sustain an expanded public media to better support quality news, journalism, education, arts, and civic information in the 21st century. The Internet has remade the landscape of free expression, access to news and information, and media production. Thus, we are well past the moment when spectrum allocated to broadcasting could be considered as distinct from that allocated to wireless broadband networks. Such networks serve as primary channels for access to news and information, increasingly edging out over-the-air broadcasting as the essential infrastructure for media distribution.

Throughout the history of U.S. policymaking, access to spectrum and the airwaves has been linked to free speech and expression. The public sphere now includes not just one-way broadcast, but two-way broadband and mobile communications platforms. Given this, spectrum allocation has to be considered not only in terms of how it can serve the historic priorities of the nation's Communications Act—localism, diversity and competition—but also the fact that anyone can produce and distribute media in the digital era. Simultaneously, the demands and structures of commercially driven media are swiftly eroding quality journalism, threatening a core foundation of our democracy. These developments necessitate new thinking on spectrum allocations and the obligations of spectrum licensees. More specifically, they underscore the need to develop policies that support and expand a broader public media to promote localism and a truly diverse marketplace of ideas, information, discourse and content.

Our proposals include:

- Supplementing ill-enforced public interest obligations on commercial broadcasters with spectrum license fees that could support multi-platform public media
- Supplanting one-time spectrum auctions with annual fees to sustain public media
- Requiring spectrum licensees for mobile broadband to adhere to non-discrimination rules for Internet content, applications, and services
- Requiring spectrum licenses for mobile broadband to adhere to universal service requirements

¹ Benjamin Lennett is Policy Director for the New America Foundation's Open Technology Institute, Tom Glaisyer is a Media Policy Fellow at the New America Foundation, and Sascha D. Meinrath is Director of the New America Foundation's Open Technology Institute. A draft of this paper was presented at the *Digital Diversity: Serving the Public Interest in the Age of Broadband* conference at Fordham University, May 3 – 5, 2011.

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- Increasing the diversity of wireless providers in local communities
 - Facilitating community and locally owned wireless broadband infrastructure via unlicensed and opportunistic access to spectrum

Introduction

As Congress wrote in 1967, “[I]t is in the public interest to encourage the growth and development of public radio and television broadcasting, including the use of such media for instructional, educational, and cultural purposes; [and] it is in the public interest to encourage the growth and development of non broadcast telecommunications technologies for the delivery of public telecommunications services.”¹ Meeting these aspirational goals has always been a challenge for both public media makers and policymakers. Now, in a moment when the private sector is no longer generating the journalism for which it was previously celebrated, many questions have been raised about new roles for public media among those who believe, using Joseph Pulitzer’s words, “Our Republic and its press will rise and fall together.”²

In parallel, the Federal Communication Commission, set up in 1927, several decades prior to the establishment of a public broadcasting system, has most recently been grappling with the consequences of digitization of information and media and the resulting demands to increase wireless broadband capacity and access. In a February 2010 speech previewing the FCC spectrum plans for the National Broadband Plan, Chairman Genachowski described spectrum as “the oxygen of mobile broadband.”³ During the speech, the Chairman introduced a key goal of FCC’s National Broadband Plan: “freeing up to 500 Megahertz of spectrum over the next decade.”⁴ More recently, Congress has passed a law supporting, and the FCC has begun steps to implement, repurposing some of the frequencies currently used by over-the-air television broadcasters for mobile broadband.

As one might expect, policy decisions involving such a valuable resource as spectrum are highly contentious. Though the FCC’s plan relies on a voluntary approach, in which broadcast station owners would receive a percentage of auction proceeds if they agree to go off the air or to share a channel with another broadcaster, it has met significant resistance from a number of these commercial spectrum incumbents.⁵ Although their opposition can be largely attributed to financial motivation to not give up the rights and privileges associated with broadcast licenses, for those who want to actually remain broadcasters, such as public broadcasters, the proposal is also not particularly attractive. Those stations that choose to remain on the air and that do not agree to share a channel may be required by the FCC to transition to different frequencies in an effort to pack the remaining television signals closer together and clear as much spectrum as possible for auction. The move would occur not far removed from the recent digital television transition and would require those broadcasters to purchase new equipment and incur additional transition-related costs.⁶

Beyond these political issues, the proposal also has the potential to unravel the half-century old framework and agreement that rewarded commercial broadcasters with free, exclusive access to the airwaves in exchange for fulfilling certain obligations in their role as “trustees” of the public airwaves—a role that many have failed to fulfill meaningfully in recent years. Through “buying off” certain broadcasters, the proposal is setting a dangerous precedent for all existing spectrum licensees. Furthermore, it is enriching a constituency that has already received billions of dollars in giveaways as a result of their lucrative spectrum licenses—even as they have consistently lobbied both the FCC and Congress to eliminate most of the meaningful public interest obligations. The decisions the FCC makes in the next several years will fundamentally shape not only spectrum policy, but the environment for communications, public engagement, and journalism in the U.S for the coming decades. This offers a moment of opportunity to learn from our past successes and failures, to reassess the trustee model for broadcast licensees, to rework the nation’s policies for spectrum access and allocation, and to re-imagine a public

media framework that maintains our long tradition of viewing spectrum as public asset and protects it as an essential medium for speech.

Public Media, Spectrum, and New paradigms for Public Interest Obligations in the 21st Century

Given the current realities of media convergence, the national broadband plan recognizes that “public media must continue expanding beyond its original broadcast-based mission to form the core of a broader new public media network that better serves the new multi-platform information needs of America.”⁷ As Goodman and Chen have recently written, the modern media environment requires us to consider public media as having four layers – “infrastructure, creation, curation, and connection” that will be utilized and provisioned in a modular fashion by “newly reconfigured public media networks.”⁸ These ideas are still nascent, but the core concept is that we have to let go of the idea that public media is solely the responsibility of a small number of broadcast entities. With the advancement of technology, both for communications and content creation, nearly anyone can become a producer and distributor of news.

To a great extent, these advances require us to expand our notions of public media to include media produced *by the* public for civic purposes across multiple platforms and not just its historic format of mission-oriented non-commercial media produced *for* the public. Public Media can no longer be equated with just public broadcasting, but can be produced by a variety of individuals and entities working within established goals and standards. To date public broadcasting stations have been slower to take advantage of the online world and share content within the existing networks.⁹ There is ongoing collaboration around technology standards to aid this, but a great deal of work lies ahead before the promise of a 21st century public media sector can be fulfilled.

At the same time, traditional, commercially funded journalism has increasingly diminished, with newspaper closings and substantial cuts to print and broadcast newsrooms across the nation. To fill that void, many media analysts have advocated for an expansion of public media, including the Corporation for Public Broadcasting, NPR, PBS and local stations. Beyond concerns of ceding the responsibility of news and journalism to a few publicly funded entities, there remain some challenging questions about this idea. Who gets funding and from what sources? What about diversity in content and viewpoints? How do you account for convergence and move public media beyond just broadcasting? Is it enough simply to fund production, or do you need other ways to ensure the public has access to content?

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All of these pressing concerns serve to reinforce the idea that we are currently at a critical juncture when policy decisions made now will cast the die for media structures, journalism and the information ecosystem for the next century. Not only are we driven to reconsider spectrum allocation (and the attendant public interest obligations) as a result of the paucity of news reporting produced by commercial entities allocated spectrum, but also because there are such tremendous possibilities for a new sort of media produced by non-commercial entities and the public at large.

Broadcasting Public Interest Obligations and the Limitations of

the Public “Trustee” Model

Before the Radio Act of 1927, over-the-air broadcasting was largely unregulated. The 1912 Radio Act allowed any citizen, upon request to the Secretary of Labor or Commerce, to receive a license to broadcast a radio signal.¹⁰ Given the infancy of the technology and the perceived ample supply of broadcast spectrum, there was not even a provision in the law to deny licenses.¹¹ However, by the mid-1920s, that had changed, as the number of radio stations soared and concerns over interference became an argument for greater regulation. The resulting debate and subsequent 1927 Act would establish a framework that has continued to shape thinking around spectrum allocation and broadcast media for nearly a century.

On one side of the debate, advocates from religious, education and labor groups proposed a common carrier system that would have required broadcasters to allow any group or individual to buy air time, ensuring widespread access to the airwaves.¹² Large commercial broadcasters represented by the National Association of Broadcasters (NAB), opposed such a framework. Citing a hyper-competitive market, they lobbied for national broadcast networks and for editorial control over programming and national networks.¹³ Congress attempted to strike a balance, falling well short of a common carrier model but requiring that broadcaster licensees act as trustees of the spectrum in exchange for exclusive use of designated frequencies in a local market.¹⁴ What duties or obligations were actually entailed in the “trustee” bargain was not clearly articulated by Congress, nor was a regulatory structure for enforcement established in the Act.¹⁵ As a consequence, guidelines for operating in the public interest have consistently changed, often in response to electoral changes and political whims.

The FCC was granted broad authority by the 1927 and 1934 Communications Acts in establishing and

modifying public interest obligations required of broadcasters to fulfill their trustee roles. In 1930, the Federal Radio Commission, the predecessor to the FCC, interpreted the trustee principle this:

[Despite the fact that] the conscience and judgment of a station’s management are necessarily personal...the station itself must be operated as if owned by the public...It is as if people of a community should own a station and turn it over to the best man in sight with this injunction: ‘Manage this station in our interest.’¹⁶

Over time, however, commercial broadcasters and the NAB have wielded their influence at the Commission and Congress to weaken specific requirements or their enforcement. The ambitious and controversial objectives of “The Blue Book” after World War II mandated four basic obligations of licensees to receive a renewal, including live local and public affairs programming, faced considerable backlash and lobbying from the NAB and commercial interests.¹⁷ The specific requirement of “the Fairness Doctrine” to cover different perspectives on political issues equally was replaced in the 1980s. The changes included the much less impactful “reasonable access” to candidates for federal office to purchase airtime for political advertisements, as well as offering “equal opportunities” for airtime to all candidates for a particular elected office (a rule that only applies to political advertisements and not to news programming).¹⁸

Currently, the remaining obligations stipulate that broadcasters will provide educational programming for children; local culture and community affairs, electoral campaign coverage and civic information; information during states of emergency; and, access to those who are visually or aurally disabled.¹⁹ Unfortunately, the extent to which these modest obligations are even binding is questionable: the broadcasting industry eliminated its own voluntary,

self-regulatory measures for programming and advertising in 1981, and the FCC scaled back its review of whether broadcasters were meeting their public interest obligations that same year, reverting to a “postcard renewal process” for licensing.²⁰ The FCC itself notes, “Because the Commission cannot dictate to licensees what programming they may air, each individual radio and TV station licensee generally has discretion to select what its station broadcasts and to otherwise determine how it can best serve its community of license.”²¹

The challenges inherent in the enforcement of behavioral- or content-based public interest obligations are underscored by a brief look at the stations’ public files. For example, stations that employ no reporters can have files longer than those who have many.²² Where they do report the provision of news and programming in the public interest, it suggests only the most cursory levels of reporting and a dereliction of their public duty. In 1968, Broadcasters allocated 43 seconds for presidential candidate sound-bites, by the 2000 election that number had dwindled to 7.3 seconds.²³

Moreover, while broadcasters are required to file quarterly reports that detail their programming that serves “the public interest, convenience and necessity” of their local communities,²⁴ they are not required to do so in a standardized format and the updating of the regulation to require them to post online has not yet been implemented after being adopted by the FCC in April 2012.²⁵ Up until now broadcasters have merely been required to maintain a “public inspection file” at their headquarters and to make that file available to the interested public upon request during regular business hours.²⁶ Because the files are not collected by the FCC itself, the Commission encourages the public to “be a valuable and effective advocate to ensure that your area’s stations comply with their localism obligation and other FCC requirements.”²⁷

The lone exception to this lax regulation is the public

interest obligations that ask broadcasters to air three hours of educational children’s programming per week and restrict inappropriate content during hours when children are likely to be watching.²⁸ As part of their public files, TV stations fill out tightly structured Children’s Television Programming Reports (FCC Form 398) each quarter, which identify the minimum three hours of instructional programming, along with documentation of the station’s adherence to restrictions on advertising during the airing of children’s content (i.e., advertising not exceed 10.5 minutes an hour on weekends and 12 minutes an hour on weekdays).²⁹ Even so, broadcasters only went along with such an obligation in exchange for protecting their valuable spectrum licenses from Congressional pressure for the FCC to take back a chunk of broadcaster spectrum allocated for digital television. When FCC Chairman Reed Hundt established the new specific guidelines, it was a condition of the FCC to provide safe haven for broadcasters as their licenses came up for renewal.³⁰

The aim of this criticism is not to say that policymakers should not aspire to enforce better reporting and fulfillment of public interest obligations. For example, former FCC Commissioner Michael Copps, in a speech in December 2010 at the Graduate School of Journalism at Columbia University, called for

[A] Public Value Test of every broadcast station at relicensing time.... If a station passes the Public Value Test, it of course keeps the license it has earned to use the people’s airwaves. If not, it goes on probation for a year, renewable for an additional year if it demonstrates measurable progress. If the station fails again, give the license to someone who will use it to serve the public interest.

His proposal outlined that such a test would include the following elements:

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1. Meaningful Commitments to News and Public Affairs Programming.
 2. Enhanced Disclosure.
 3. Political Advertising Disclosure.
 4. Diversity
 5. Community Discovery.
 6. Local and Independent Programming.
 7. Public Safety

Although we are supportive of Commissioner Copps' aspirations for higher quality broadcasting, we recognize that any such recommendations seem unlikely to encourage currently disinclined commercial broadcasters to better fulfill the public interest obligations in ways they did in prior decades.³¹ Furthermore, as Henry Geller notes, "the object of PIOs is not just quantity but high-*quality* educational programming... the commercial system has no such incentive or history."³² Snider adds:

"Advertisers prefer programming that delivers audiences with preferred demographics... [that] include upper-class Americans with lots of money to spend and Americans between the ages of 18-39 who are not hardened in their buying habits. Programming that focuses on the interests of the young and old as well as the poor and minorities, thus receives proportionately less funding and prime time exposure."³³

In short, the behavioral regulation as currently constituted has yielded much less value than hoped, in part because of the challenges of enforcement as well as the incentives of for-profit commercial broadcasters. Thus, rather than continue to perpetuate a weak and ineffective system of programming and content obligations, it is time for policymakers to consider other options that require broadcasters to give considerably more back to the public in exchange for continued access to the valuable public airwaves.

Particularly in light of the challenges for journalism

and news, and the current debate over the future of over-the-air broadcasting, there is an impetus for a new public service model not just for broadcast licensees but for all licensees benefiting from exclusive access to the public airwaves.

Spectrum as "Private Property" and the Auction Model

FCC authority was first granted in the 1927 Radio Act, allowed for "the use of such [radio] channels, but not the ownership thereof."³⁴ This non-ownership clause was seamlessly transferred into the 1934 Communications Act.³⁵ Importantly, these acts clearly established the foundation for licensure rather than exclusive private ownership of the airwaves. Three decades later, Ronald Coase wrote his seminal 1959 article, "The Federal Communications Commission," which helped launch an intellectual movement in support of spectrum privatization. In it, he lamented the fact that these early laws codified the public interest doctrine and established spectrum as public property, albeit under federal oversight and management.³⁶ Coase's market-based approach was later adapted to fit a licensure model, falling short of treating spectrum as private property and instead replacing the comparative hearings model with allocating spectrum to the highest bidder via auctions, a practice that became increasingly standard in the 1990s.

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Although recent spectrum auctions have resulted in billions of dollars for the federal treasury, the auction approach has also disproportionately benefited powerful economic interests and privileged profit-making uses, especially given the

prohibitive upfront costs for purchasing exclusive rights to spectrum. Since pioneering the use of spectrum auctions as the dominant paradigm for frequency assignment, the United States has seen diversity and competition suffer greatly, with the levels of independent carriers and minority and women-owned spectrum licenses plummeting and consolidation of spectrum ownership increasing.³⁷ Combined, two companies, Verizon Wireless and AT&T Wireless, control over 75 percent of spectrum licenses auctioned since the 1990s.³⁸

“Although recent spectrum auctions have resulted in billions of dollars for the federal treasury, the auction approach has also disproportionately benefited powerful economic interests and privileged profit-making uses.”

The underlying rationale of the private property approach to spectrum management views the market as a neutral, if not benevolent, arbiter. As a consequence, auctions have often led policymakers to ignore the inherent biases of the approach toward the monetization of public interests and externalization of benefits that cannot be commoditized.

These concerns over the shortcomings of the auction model are increasing as traditional broadcasting, along with other forms of media and news content, are rapidly converging onto the Internet and broadband networks. Today’s broadband communications providers, both wired and wireless, are in an growing position of power to control the flow of information over their networks and fundamentally shape the public’s access to information, news, and multiplatform content. Just as many broadcasters nearly a century ago lobbied to maintain editorial control over the content that utilized their frequencies, many of today’s broadband providers are seeking to control the content that flows over their networks, including

what content and application users can access and how they can access it. As a consequence, the locus of the spectrum and public communications battle must increasingly shift away from broadcasting to mobile and wireless broadband, where there is a glaring need to develop policies to address issues of access, competition, innovation, and protection of a diverse ecosystem of ideas, information and news.

Reforming Public Interest Obligations (PIOs) to Fund Public Media and Promote Access to Diverse and Quality News and Journalism

In many respects, we are at a similar crossroads as 1927, as demand for spectrum is substantially outpacing current allocation policies and a national need to support quality news and journalism. This requires policymakers to consider as broadly as possible how spectrum should be allocated and how licensees should serve the public interest. Will we once again depend on the kindness of profit-driven providers to act as “trustees” of the public spectrum, or enact policies that empower the public to become media and news producers, ensure access to a rich and diverse marketplace of ideas, and support quality journalism and news production?

The 1927 Radio Act allowed for “the use of such [radio] channels, but not the ownership there of.”³⁹ This non-ownership clause has persisted, even as comparative hearings were replaced with auctions and in spite of considerable efforts by commercial interests and free market conservatives to wholly convert licensees into private property. Although the auction system has provided Verizon, AT&T and other carriers with certain aspects of property rights over the spectrum they gained (their payments for licenses are in exchange for exclusive rights to use the spectrum), the spectrum remains a publicly owned asset like the oceans, the atmosphere, and

national parks.

Given the vast importance of the airwaves in today's Information Age and their role as an essential medium for speech and media, the case for public interest obligations on spectrum licensees remains convincing. The scarcity argument that served as justification for imposing obligation on licensees still holds even as spectrum use has become increasingly efficient (Although, as we discuss later in the paper, the scarcity problem is no small part driven by antiquated spectrum policies that fail to leverage advances in wireless technology). The recent Presidential directive to re-allocate the 500 MHz spectrum for mobile broadband underscores that the scarcity is still as prevalent in the environment of wireless communications as it was in the broadcast context.

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As the Supreme Court noted in its landmark decision in 1969 *Red Lion Broadcasting Company v. FCC*:

When there are substantially more individuals who want to broadcast than there are frequencies to allocate, it is idle to posit an unbridgeable First Amendment right to broadcast comparable to the right of every individual to speak, write or publish.... A license permits broadcasting, but the licensee has no constitutional right to be the one who holds the license or to monopolize a radio frequency to the exclusion of his fellow citizens.

In essence, because the 1927 and 1934 Act removed the public's free speech rights in broadcast, as only those licensed would be able to freely broadcast, it was only justified by requiring broadcasters to serve

the public interest, convenience, and necessity. In many respects, the Courts have recognized a clear connection between spectrum and free speech, and placed a premium on the speech rights of the broader public over the licensee. In light of the current scarcity reality and the growing import of wireless communications as a medium for information and news, the justification for requiring a broader class of spectrum licensees to serve the public interest remains. As broadcasting converges to broadband, and mobile broadband becomes increasingly pervasive, who has access to the public airwaves, what they provide in return for exclusive use rights, and how they utilize this valuable resource will have a considerable impact on public media and the nature of news and journalism.

We believe the success of an expanded public media will rest on three core structures: a broad, diverse vision of public media; a sustainable source of funding; and ubiquitous public access to its content and the opportunity to participate in its production. We do not cover the first item in this paper. Although in brief, we contend any expanded vision of public media must encompass funding beyond traditional sources such as CPB and NPR to include a variety of entities, business models, citizen journalism, and local news production.⁴⁰

With respect to the latter two structures, we believe the nation's spectrum policies will play a critical role in both the funding of public media and ensuring that the public has the ability to access and create content. Below we propose several critical and necessary reforms to public interest obligations of spectrum licensees that recognize the current challenges of quality journalism and the increasing relevance of the mobile communications to the future of public media and free speech.

Spectrum Fees and Funding Public Media

Among the main challenges for expanding public media to fill the journalism gap is a viable and

sustainable source of funding. Public media institutions such as PBS and NPR are currently sustained via fees from stations derived at least in part on funding from Corporation for Public Broadcasting, state funding, and donations from the viewing public. Any effort to expand their current programming would be severely limited by a lack of funding. While Congress could increase the current appropriation, it seems extremely unlikely given the current heightened discussion around the deficit and antipathy of many conservative policymakers towards public broadcasting.⁴¹ Thus, public media needs a more sustainable and secure stream of funds.

Federal trust funds, such as the Highway Trust fund, typically match an earmarked revenue source (including excise taxes, customs duties, royalties, rents, user fees and sales of goods). As the NAF report, “The Digital Future Initiative” noted:

[E]armarked funds have two obvious advantages: First, if they are properly structured, they can provide a dedicated source of funds that will be used to finance a specific activity; if the related expenditures are limited to the fund’s income, there is no adverse impact on the federal budget, nor even a need to go through a traditional appropriations process each year. Second, earmarked funds may appeal to a public interested in supporting a particular activity by linking funding sources to the targeted activity – and, of course, when a user fee is assigned to the public need, then those who consume the service provided will typically contribute most to its cost.⁴²

Given the current budget realities, establishing a similar fund for an expanded public media may be the most feasible way forward. This idea mirrors the proposal of the Carnegie Commission on the Future of Public Broadcasting (Carnegie II) in 1978 to create an endowment for public media as well as the more

recent the proposal to leverage spectrum auction proceeds to fund a trust for public media in the “Digital Opportunity Investment Trust, “developed by former FCC Chairman Newton Minow and former PBS President Lawrence Grossman in 2003.⁴³ The latter proposal would have leveraged proceeds of spectrum auctions and spectrum fees to create a permanent revenue stream for technology training, the arts, and public media.⁴⁴ As a New America paper also proposed several years ago, revenues generated from spectrum auction revenues and fees could be directed to support a private and independent “Digital Future Endowment, in much the same way that many of the nation’s pre-eminent cultural and educational institutions operate (such as the Kennedy Center for the Performing Arts and leading universities).”⁴⁵

Earmarking funds from spectrum auctions for specific public purposes is not unprecedented. For example, the Federal Spectrum Relocation Fund, established under the Commercial Spectrum Enhancement Act of 2004, reserves small portion of auction receipts of spectrum reallocated from federal use to commercial use. The funds cover costs for the military and other public agencies to purchase state-of-the-art digital equipment and other transition costs in return for clearing designated bands for commercial use.⁴⁶

Rethinking Behavioral PIOs for Broadcasting: A Spectrum Fee to Fund Public Media

In return for their modest service back to public, broadcasters have received a litany of benefits courtesy of their free licenses and bequeathed through federal policy. Notable examples include the 1996 Telecommunications Act, in which broadcasters were awarded an additional 6 MHz channel to broadcast digital television, and then held onto it for over a decade before finally being forced to give it back only after the 9/11 attacks and the need for additional spectrum for public safety.⁴⁷ They

were also given lucrative “must carry” rights on cable and satellite television. Broadcasters can use either their must-carry rights (zero cost carriage) or retransmission consent (a negotiated fee for carriage) depending on their bargaining strength.⁴⁸ The large media companies that own local broadcast network affiliates have considerable leverage in negotiating retransmission agreements above other content providers. As Snider notes, essentially “must-carry rights are negotiated on a cartel basis. If a satellite or cable provider wants to carry one local broadcast channel from a local market, it either must carry all the local broadcast TV channels from that market or carry none at all.”⁴⁹ As demonstrated by the *FOX vs. Cablevision* case, such negotiations have become showdowns between big media, with the public caught in the cross-fire.

For broadcasters, exclusive spectrum licenses have been the gift that keeps on giving. But the American public has received relatively little in return for its generosity. An alternative to the current ‘trustee model’ and behavioral enforcement of public interest obligations is assessing a spectrum fee on commercial broadcasters. This idea is not new. The former General Counsel of the FCC, Henry Geller, has long “argued that broadcasters ignore the local public interest, that the whole ‘public trustee’ idea is broken, and that instead of trying to make broadcasters play by the rules we should just make them pay a reasonable fee to support public broadcasting.”⁵⁰ Geller contends:

By taking some modest fee from commercial broadcasters for their use of the public spectrum in lieu of the public trustee obligation, noncommercial television could be adequately funded to deliver high-quality public service programming. The objective is to obtain such programming, but since the government soundly cannot review for quality, we are dependent upon the broadcaster to present the high-quality public service programs. The

noncommercial system has demonstrated that it will strive to do so; the commercial system, under fierce and growing competition, has no such history or incentive.⁵¹

Geller’s proposal would require Congress impose a spectrum usage fee of five percent of gross advertising revenues on commercial broadcast television licensees.⁵² As he further argues, “Five percent is the same levy Congress allows cities and towns to impose on cable companies’ gross revenues for terrestrial rights-of-way along city streets.” Five percent of gross revenues “is also the rate that Congress chose to levy broadcasters who operated ‘ancillary services’ (services other than free public video broadcasts) with the extra spectrum they were granted for high-definition television under the 1996 Communications Act.”⁵³

Recent administrations, including those of Clinton, Bush and Obama, have routinely submitted budgets to Congress proposing a spectrum user fee on commercial TV broadcast licenses. Due to the strong lobbying influence of broadcasters, however, it has never passed the Congress.⁵⁴ These political challenges present a considerable roadblock to implementing this policy. Advocates of maintaining existing broadcaster public interest obligations have, in the past, rightly been opposed to ceding them in exchange in for spectrum fees that may simply be funneled into the federal treasury. However, if policy can ensure that programming from an expanded public media sector fills the void of news that may result from a shift from behavioral public interest obligations to a user fee, then such a shift could garner much broader support.

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The amount of funding generated from a modest 5

percent revenue spectrum use fee would be substantial—more than adequate to fund existing public broadcasting institutions as well as providing support to expand beyond the existing platforms, entities, and programming. According to a report from Free Press, a 5 percent spectrum fee would generate nearly \$1.8 billion in annual funding for public media based on local broadcast station revenues of \$26 billion in 2007.⁵⁵

Introducing a spectrum fee on broadcasters in exchange for the removal of certain programming requirements would also be a more sound economic policy than the planned approach to re-allocate broadcast television spectrum for mobile broadband uses. Thus, rather than setting the dangerous precedent of buying off licensees who were awarded exclusive spectrum rights for free, the introduction of a spectrum fee would create an opportunity cost for broadcasters. As Geller notes, this would “incentivize those licensees genuinely not interest[ed] in over the air broadcasting to go off the air, rather than sitting on the spectrum in hopes of waiting for a lucrative buyout.”⁵⁶

The considerable shortcomings of the current public trustee model raise the question of how much it is truly benefiting the public interest. Certainly there is a risk involved in changing the policy. However, sustainably funding entities actually interested in producing high-quality news and journalism in the public interest would seem to be a better way forward.

Thus we recommend specifically:

- Supplementing ill-enforced public interest obligations on commercial broadcasters with spectrum license fees that could support multiplatform public media.
- Collecting a modest spectrum use fee of 5 percent of revenues from all commercial broadcasters.
- Allocating revenue from the fee to a federal trust to support an expanded public media

including existing entities such as CPB and new local journalism outlets.

Beyond Broadcast: Auction Revenues, Annual Spectrum Fees, and other Use Fees to Fund Public Media

In similar fashion, since the spectrum allocations or re-allocations (in the case of the TV Band) for other communication forms, such as mobile broadband, will involve a tradeoff between the public’s free speech rights and commercial interests, it is justified to require these licensees to similarly serve the public interest, convenience, and necessity. The results of these and similar spectrum allocations will fundamentally shape the type of media the public produces (and consumes), and the monies generated from these are critical as we consider the nation’s media future.⁵⁷ Particularly, given the eroding dominance of broadcasting, the convergence of the public’s access to all forms of media on broadband networks including wireless, the economic value of spectrum access, and the subsequent power of these licensees within the broader media ecosystems, it follows that revenues from these uses would be appropriately directed to support public media.

The most immediate policy change would be to direct a modest percentage of funds from spectrum auctions to support an expanded public media. The FCC regularly auctions spectrum, often generating billions of dollars in revenues to the federal government. Congress could earmark a portion of the revenue from all future spectrum auctions to an established public media trust fund as discussed above. A similar proposal was included in legislation for the Digital Opportunity Investment Trust (DOIT) Act.⁵⁸

However, a more advantageous proposal would be to require all licensees pay an annual spectrum fee, which then could be directed to support public media. Rather than potential licensees bidding in

terms of a one-time payment, they can bid in terms of a fixed annual fee or a fee based on a small percentage of their revenues. Although auctions may offer a higher, immediate influx of revenues in return for an exclusive license, annual spectrum fees can help fund public media in perpetuity. One-time-only auction payments also deprive the public of a long term return on its asset. As evidenced by the recent demand for increased access to spectrum, it is difficult to predict how scarce or valuable spectrum will be in the future.⁵⁹ One-time auctions fail to account for this future value, often affected by market estimates as well as other current economic conditions such as access to credit, which can diminish the value of spectrum at auction. Annual spectrum fees allow for the public to earn a rate of return that reflects to actual value of the spectrum.

Annual spectrum fees have the added benefit of encouraging more entrants and greater competition by reducing the capital needed initially to acquire a license.⁶⁰ More importantly, they create an opportunity cost for the licensee to assist in aligning incentives away from spectrum warehousing or underutilization to more efficient use of spectrum and secondary market transactions.⁶¹ Currently, there is almost no option for systematically repurposing underused spectrum. Once a license is granted, it is extremely difficult for the government to reallocate it to other uses or users, even if it is underused or not used at all. Although a licensee may choose to ignore less profitable rural areas, an efficient spectrum fee could induce the licensee to lease spectrum to firms willing to serve those areas rather than leave the spectrum idle.⁶² Properly designed, spectrum fees could also accelerate the build-out of services while providing firms the flexibility to make appropriate business decisions.

Some sort of spectrum fee is used in multiple countries around the world as listed in Table 1 (see pg. 14). Most well-known is the UK case, where television users pay a yearly fee to the government and this funding is used to support the BBC.

Importantly it should be recognized that unlike the UK, where fees are levied on owners of television sets directly to raise funds dedicated solely to supporting the BBC, other countries levy fees on other (and in some cases all) spectrum allocation. However, not all fees raised are dedicated to funding public media.

Thus, we recommend specifically:

- Directing a percentage of revenues from future spectrum auctions to a federal trust dedicated to supporting public media.
- Supplanting one-time spectrum auctions with annual spectrum fees on licensees to ensure the public a long-term return on its asset and lower barriers to entry to enhance competition and diversity.
- Directing the new annual spectrum fees to a federal trust for public media.

Additional PIOs to ensure an open and accessible medium for public media and speech

We are living in an age where, using the analysis of the aforementioned Goodman and Chen, “the connection layer”... those functions that are specifically and exclusively focused on engaging individuals and communities with public service media” can be so much more rich and effective. Given that making the most of this involves approaches that extend well beyond those employed by traditional broadcasters, spectrum allocation becomes tremendously complicated. As Goodman and Chen describe, for example, a public health program led by a public broadcaster might be premised on collaboration across platforms rather than on a standalone solution delivered by the broadcaster alone.⁶³

In *Rethinking Public Media: More Local, More Inclusive, More Interactive*, Barbara Cochran describes these new assumptions further:

The new technology enables public media to transform from the one-to-many broadcast model to a distributed, networked model. Existing stations can transform into hubs that bring communities together, facilitate dialogue and curate vital information.

Laura Walker, president and CEO of New York Public Radio, wrote of her organization's mission to make government and institutions accountable to the people they serve. 'We'll create new, far-reaching tools to reflect and reach diverse audiences and to establish a variety of communities across interests, heritage, neighborhood, and demographics...We seek to create active, rather than passive, consumers of information, increased opportunities for participation by news consumers and marginalized communities, and more transparent, more effective, and more accountable civic and government agencies.'⁶⁴

Beyond securing adequate and sustainable funding for an expanded public media to produce quality news and journalism, it is critical to recognize the importance of ensuring that the public has access to this publicly-funded content as well as the opportunity to become creators. There is certainly no guarantee of this in the digital world of broadband communications, especially when it comes to wireless access.

Up until 2005, the U.S. regulatory precedent of common carriage and communications history from the telegraph, to the telephone, and even Internet access prevented providers from unjustly discriminating among users or uses of the network. However, no such protections exist in the current world of wireless broadband communications. Contradictory to Verizon's marketing rhetoric that its users "Rule the Air," it is in fact Verizon and AT&T that rule the nation's broadband airwaves, dictating which devices users can connect to the

network, and what content, applications, and speech they can access.

In similar fashion, if large segments of the public cannot access a vital medium of communication because it is not available or prohibitively expensive, then the goal of ensuring public access to a diverse marketplace of ideas, news and information will not be met either. Therefore, another critical issue in sustaining public media and ensuring access to its rich content is universal service. In the past, policymakers have imposed relatively few build-out requirements on licensees to ensure a provider deploys service to the entire license area. In fact, there are rarely any requirements whatsoever to ensure that an entity that secures a license at auction must deploy service at all.

Thus, we outline two key obligations on licensees for the 21st century: openness and universal service. This is in some ways a departure from the current regulatory framework for spectrum licenses awarded at auction. However, as the Commission noted after the 1927 act, the test for determining the public interest was "a matter of comparative and not an absolute standard" and the "emphasis must be first and foremost on the interest, the convenience, and the necessity of the listening public, and not on the interest, convenience, or necessity of the individual broadcaster or the advertiser."⁶⁵

"The FCC has considerable leeway to place specific conditions on licensees to further the public interest"

Moreover, the statute providing authority for the FCC to organize spectrum auctions does not specify the extent to which auction revenues should direct federal spectrum policy, only instructing the FCC to "pursue the public interest" and forbidding them from "merely equating the public interest with auction revenue."⁶⁶ The FCC has considerable leeway to place specific conditions on licensees to further the public interest and has placed conditions

and limitations on its past auctions in line with this goal, such as in the case of the auction of the 700 MHz C block, where the winning bidder was subject to open device requirements.⁶⁷

must balance the First Amendment rights of broadcasters against the First Amendment rights of the public. Crucially, it ruled that when these rights come into conflict, it is “the right of the viewers and

Country	Annual and Related Fees	Fee Type	License Types
Austria	0.1 – 0.2 % of gross turnover	Revenue sharing	All licences
Bahrain	1% of gross revenues	Revenue sharing	Mobile
Bhutan	Pre-determined fixed amount	Annual licensing fee	All licences
Chile	Variable fixed fees	Annual licensing fee	All licences
Croatia	USD 6.6M	Annual licensing fee	3G Mobile*
France	1% of 3G revenues	Revenue sharing	3G Mobile
Greece	.025 – 0.5% of gross turnover	Revenue sharing	All licences
Hong Kong, China	15% of gross revenues with escalating annual minimum payment	Revenue sharing	3G Mobile
India	6% - 10% of gross revenues	Revenue sharing	Fixed and mobile
Ireland	0.2% of gross turnover	Revenue sharing	Fixed and Mobile
Italy	EUR 38 million	Annual licensing fee	3G Mobile
Jordan	10% of gross revenues	Revenue sharing	Mobile
	USD 100,000	Annual licensing fee	Mobile
	5% gross revenues	Revenue sharing	Fixed monopoly
Kenya	0.5% of gross turnover	Revenue sharing	All licences except paging
Luxembourg	0.2% of gross turnover	Revenue sharing	Mobile
Maldives	5% of gross turnover	Revenue sharing	Mobile, Fixed and ISP's
Oman	12% gross revenues	Revenue sharing	Mobile
Korea (Rep.)	Approximately 1- 3.0% of gross revenues (annual adj.)	Revenue sharing	All licensed operators
Spain	0.2% of gross turnover	Revenue sharing	Fixed and Mobile
Tanzania	1.0% of annual turnover	Revenue sharing	Fixed, long distance
	1.5% of annual turnover		Mobile
Venezuela	5.3% of gross revenues	Revenue sharing	Mobile

Table 1 (Source: Dave Karan, Kumar Saurabh, Sarbjee Kaur, Shubham Satyarth, and Valia Chintan. “Analyzing Revenue Sharing Model [sic] And Developing an Efficient Auction Framework.” (IPR, 2008).

Openness

In the *Red Lion* ruling in 1969, which remains the key Court doctrine on broadcasting and the First Amendment, the Supreme Court held that when the government regulates access to the spectrum, it

listeners, not the right of the broadcasters, which is paramount.”⁶⁸ Red Lion provides a key understanding of the context, one which is sometimes lost in debates, in which discussions about the Internet are separated from more traditional broadcasting. But key to the future is to

take the lessons learned from the Internet—that openness matters—and apply them to other realms.

First and foremost, the value the Internet has created in terms of media production has to be recognized. Much of this has come about as a result of its open nature. In this model, traffic is treated equally and not prioritized or differentiated. The key to much of its success in bringing new voices and more conversation into the public sphere has been relatively low barriers to entry to a market in which individuals and organizations have been able to experiment and innovate.

In the past, openness in broadcast was provided directly via the allocation of exclusive licenses to both private and public broadcasters. That was open enough, and consequently we live in a world where *Nova*, independent documentaries from ITVS, and Sesame Street reach households on the same terms, and with the same technical quality, as any commercial content. But we are at risk of entering a world in which the providers of 3D *Nova*, or human rights videos from WITNESS or mobile educational apps may simply not be able to afford the price of a ticket on the networks that carry that media in the 21st century.⁶⁹

Unlike telephone service, where the “government imposed common carrier rules, remove[ed] the phone carriers’ ‘editorial discretion’ over speech on their lines,”⁷⁰ mobile broadband providers, even with the FCC’s most recent Network Neutrality rules permit carrier discretion over what content, applications, and services can run over their network. The current ability of mobile providers to dictate the content and applications that are available over their networks have in no small part contributed to the proliferation of “walled gardens” of competing Internet application stores with gatekeepers, tied to specific devices and networks that look vastly different than accessing the internet via PCs in the wired world. It can be argued that existing public media institutions such as NPR have managed to succeed in some of these walled

gardens, and that an even more restrictive environment may seem more advantageous for financially supporting news and journalism. That said, it is important to recognize that these markets remain nascent. There is an unfortunate history of gatekeepers consistently leveraging their market power to prioritize profit and commercial interests over public interests when there is a lack of regulatory protection. The market for wireless communication remains quite consolidated, with two dominant providers—AT&T and Verizon—that control both the vast majority of wireless consumers and the most valuable spectrum available for mobile broadband.

“No less important than access to audiences by public media producers is reasonably priced and widely available broadband at speeds that permit two-way engagement in media production and consumption.”

Without regulatory protections to prevent market abuses and protect consumers’ access to all content and applications, including public media, network providers have a strong incentive to increasingly monetize scarcity on the network, thereby increasing barriers to entry for all public media creators and producers. Non-discrimination on wired and wireless broadband networks is the first line of defense for maintaining public access to public media, given that most consumers rely on commercial broadband infrastructure to access online content. Without this, many of the opportunities for a new sort of public media would fall away. Quite simply, without such an architecture and regulatory protections, the number of people involved in public production of media would be inherently limited.

Thus, we recommend specifically:

- Requiring spectrum licensees for mobile broadband to adhere to non-discrimination

rules for Internet content, applications, and services.

Universal Service

No less important than access to audiences by public media producers is reasonably priced and widely available broadband at speeds that permit two-way engagement in media production and consumption. Unfortunately, the high price of spectrum at auction only furthers the incentive for commercial users of spectrum to often prioritize higher revenue customers and delay coverage to less densely populated areas.⁷¹

This was not case in the analog broadcasting; where often simply by increasing the power of their signals, broadcasters were able expand their service area. In fact, broadcasters consistently lobbied the FCC to increase their signal power to expand to service areas well beyond their communities of license. For mobile networks, given the more costly requirements of constructing additional infrastructure (i.e. towers.) to spread connectivity, providers that secure licenses that cover both urban/suburban and rural areas have significantly less incentive to cover their entire service areas. The FCC sought to address this issue in the AWS spectrum auctions, where it established a “substantial service” requirement (“defined as service which is sound, favorable, and substantially above a level of mediocre service which just might minimally warrant renewal”) where “any licensee that failed to meet the requirement will forfeit its license and the licensee will be ineligible to regain it.”⁷² However, the provision did little to discourage a consortium of the nation’s largest cable operators from purchasing spectrum in AWS-3 auction and then subsequently warehouse it, in no small part because of the weakness of the “substantial service” requirement and the fact that licenses were not up for renewal for another 10 – 15 years from issuance.⁷³

Section 309 of the Communications Act provides for spectrum auctions to resolve conflicting applications

for an available license, but in no way diminishes the FCC’s responsibility to ensure that the ultimate use of the public airwaves promotes the public interest. In the past, the FCC has demurred from imposing specific conditions on wireless licensees on the grounds of promoting flexibility for licensees and that the cellular service was a relatively nascent service. Certainly, the latter no longer is true, given the growing prominence of mobile broadband.

In the wired and telephone context, the Universal Service Fund (USF) has promoted universal service even in high cost rural areas through the subsidizing a carriers’ cost of providing service. Similarly, as part of the National Broadband Plan, the FCC established a \$300 million Mobility Fund to publically subsidize the deployment of 3G mobile broadband services in currently unserved areas.⁷⁴ And although, in some cases a federal subsidy may in fact be necessary to serve only the most remote areas (less than 2 percent of the nation), providing service even in currently underserved and unserved rural areas can be a profitable enterprise. But without appropriate requirement or incentives, providers will continue to ignore less profitable low-income or rural areas.

For all its benefits, the USF has proven to be inefficient and unsustainable. Thus, policymakers should consider a number of options to require or incent mobile providers to serve the entire area of their license. More strongly designed and enforced build-out requirements could ensure that all areas within a spectrum license are covered. Annual spectrum fees, as discussed above, could further provide an opportunity cost for mobile providers to sit on idle spectrum and incent them to either build-out across their entire license area or lease-out the spectrum to other entities that are willing to provide service. Another possibility that would leverage new technological advances, such as “smart” radios, would be to include a “use it or share it” condition on all spectrum licensees.⁷⁵ Under this proposal, any spectrum that a licensee is not using would be listed in a geo-location database currently be developed for

TV White Space technology (discussed below) and available to any provider or the public with FCC approved wireless devices and equipment.⁷⁶ By providing open access to the spectrum, the proposal would remove a significant upfront cost of buying spectrum at auction that would enable more local and community owned mobile networks.

Thus, we recommend specifically:

- Placing strongly enforced build-out requirements on mobile licensees.
- Utilizing annual spectrum fees to provide an opportunity cost for mobile licensees to leave spectrum unused.
- Placing a “use it or share it” condition on mobile licenses that would allow any provider and the public to use the spectrum.

The Importance of Spectrum Allocation Methods and Public Media: Supporting Diversity and Innovation

Establishing a well-funded, broad-based public media still overlooks the critical importance of addressing underlying structural issues with respect to spectrum access. Though provisions for open access and universal service can ensure the public's access to and the free flow of information, they will not facilitate multiple mediums for free speech and public media, while also creating networks that empower users to produce their own media.

There is a trap for advocates of public media in focusing solely on policies that maximize available funds for the U.S. Treasury, which could subsequently allocate them towards public media. For example, spectrum auctions driven by the goal of revenue maximization are likely to encourage the creation of monopolies, “which would create the highest profits before spectrum fees, and therefore would sustain the largest fees.”⁷⁷

Moreover, the history of maintaining and enforcing

regulatory obligations on monopolies or large commercial interests should give public media advocates pause. We need look no further than the history of the broadcasting industry to both understand the ability of powerful commercial interests to undermine regulations and the deleterious impact of consolidation on news reporting and journalism.

Decisions around which entities have access to the airwaves will determine whether the environment will sustain quality news and journalism. For example, the final passage of the Local Community Radio Act will increase the number of geographic locations where often underserved local audiences can be served.⁷⁸ Diversity of networks and models for communications networks can serve as a hedge against emerging monopoly providers while facilitating competition and innovation. As David Moss and Michel Fein argue, the driving concern behind the 1927 Radio Act was primarily technical, not economic; officials were less concerned about devising an economically efficient means of allocating scarce spectrum and more concerned with preventing monopoly markets and the concentration of political power.⁷⁹ By privileging democratic principles over economic priorities, a number of government officials involved in these early policy debates aimed to create a diversity of voices on the airwaves and maximize social welfare.

“Diversity of networks and models for communications networks can serve both as a hedge against emerging monopoly providers, while facilitating competition and innovation.”

Ensuring such diversity will require policymakers and public media advocates to support reforms of existing spectrum allocation processes, while also leveraging new communication technologies to transform policies managing access to the airwaves. Spectrum auctions can be designed to factor in policy goals such as facilitating competition or

increasing access in unserved or underserved areas.⁸⁰ Designs should reflect the market realities and allow for conditions that will move toward policy goals, even if they do not maximize short-term revenues for the U.S. Treasury or a newly established federal trust for public media.

In particular, to ensure that spectrum allocation decisions and assignments as a whole are fair and maximize the public benefit, it is critically important to look beyond the current focus on spectrum auctions as the sole solution. As is often the case, technology has outpaced regulation and new thinking is needed to take advantage of innovations that will reduce scarcity and dramatically increase spectrum access and efficient use.⁸¹ Advances in telecommunications and other digital technologies have enabled entirely new approaches for spectrum licensure and use. End-user wireless devices can be “smart,” capable of adapting to changing environments and maximizing efficient use of available spectrum to deliver mobile, affordable broadband connectivity. As these technologies continue to advance and more efficient and shared use of spectrum becomes possible, increasingly the historic scarcity rationale will no longer hold. As a consequence, traditional spectrum management strategies will soon become largely obsolete. This impending paradigm shift in spectrum use will require policymakers and public media supporters to support a broad set of spectrum allocation options to meet both increasing demand for spectrum access, promote continued innovation and support diversity.

We contend that the two approaches which both leverage these advances and will be the most beneficial and supportive of public media and diverse marketplace of ideas and information are unlicensed and opportunistic access. The key factor in both of these approaches is the considerable extent to which they level the playing field for both commercial and citizen access to spectrum and allow for a diversity of network models.

Thus, we recommend specifically:

- Ensuring that spectrum auctions are designed to not just maximize revenues, but factor in policy goals such as promoting competition, encouraging new entrants, or increasing access in unserved or underserved areas.
- Supporting alternative approaches to spectrum allocation that will allow for greater access and use of spectrum on an unlicensed basis by the public.

Unlicensed Spectrum: Citizen Access to the Airwaves

Typically, spectrum allocation policies have developed processes to choose what entities or uses are granted access to specific frequencies, and commensurately privilege the speech of some users over others. But rather than establishing a hierarchy of speech rights and limiting access, unlicensed access treats spectrum more as a public commons, open to all but with established norms or rules for use (i.e. equipment standards).

Despite pronouncements from private property advocates that such a model would result in a “tragedy of the commons” and undermine its usability, unlicensed spectrum access has spurred rampant innovation and communications. Unlicensed spectrum is widely used in a number of different products in countries around the globe. Everything from microwave ovens to garage door openers, baby monitors and Wi-Fi equipped laptops utilize unlicensed spectrum. Today, almost all new laptops, as well as smartphones, are sold with Wi-Fi radios. Many airports, cafes, libraries, and other public spaces provide wireless connectivity (either for free or for a fee). Unlicensed bands have become a critically important driver for new technologies and broadband connectivity; most rural and small Wireless Internet Service Providers (WISPs), which do not have access to the capital to purchase spectrum at auction, make widespread use of the unlicensed bands to serve their customers. In

addition, large mobile providers like AT&T and Verizon regularly use Wi-Fi to augment their own mobile broadband service offerings and offload smartphone traffic from their cellular network.

The benefits of unlicensed spectrum include more efficient use (i.e., more traffic can be carried) through spectrum sharing, reduced barriers to entry for new providers, and greater experimentation and innovation.⁸² Originally, unlicensed spectrum allocations such as the 2.4 GHz band were considered a "junk band" with limited value and few possibilities for viable use. As digital radio technologies developed and the importance of inter-device connectivity grew, unlicensed spectrum provided the essential open platform to support applications that had not been previously anticipated. With the advent of 802.11 standards, which first passed in 1997, the junk bands began to have a substantial and real social and economic value. As the technologies matured (in particular, with the passage of 802.11a and 802.11b in 1999 and 802.11g in 2003), the use of Wi-Fi increased dramatically.

Among the most important innovations that unlicensed spectrum provides for implementation of a reconceived and more participatory vision of public media is through mesh wireless networking. Rather than relying on a centralized build-out and hierarchical architecture, mesh networking allows users to literally build the network organically over time. Devices connect to other devices to create a web of connectivity that encourages and requires active participation from its users.⁸³ This in turn lays the groundwork for a network that prioritizes community and civic uses, including media and news production and sharing. Thus, a community developed mesh network not only provides an open medium for community and public media, but also promotes users to move beyond mere consumption and become active producers of content, news, and information.

Mesh networking makes this possible by creating a

community level intranet. Intranets are common to businesses, where computers connect to share Internet connectivity, printer and file server access via a Local Area Network (LAN). In a mesh, devices across the community can be connected to form a community wide-LAN or Intranet that allows users to communicate to other local users on the network, create and share content, and design local applications and services to run on the Intranet.⁸⁴ For example, the Athens Metropolitan Wireless Network in Greece "has created dozens of services and applications for its members. These include an auction site Wbay; a search engine Woogle; a channel for user-created content wTube... weather reports for each Greek island; and webcams that broadcast traffic, among other applications."⁸⁵

Using local Intranets, communities can set up forums for political debate or stream videos and audio from local events such as town council and PTA meetings.⁸⁶ In Urbana-Champaign, Illinois, the Chambana.net project created a community LAN that interconnects the local mesh wireless network with multi-media resources located at the Urbana-Champaign Independent Media Center (UCIMC) and the local low power FM radio station, WRFU 104.5 FM (Radio Free Urbana). This allowed for innovations such as the streaming of live shows from the performance venue, which are also simulcast through the radio station and the Internet.⁸⁷

"A community developed mesh network not only provides an open medium for community and public media, but also promotes users to become more than consumers but active producers of content, news, and information."

Although, mesh wireless networks offer enormous potential for connecting neighborhoods, cities, and expansive rural areas (for example, Guifi.net in the rural Catalonia region of Spain has over 19,000

miles of wireless links⁸⁸) their reliance on a few swaths of unlicensed spectrum will become increasingly a barrier for scaling up their capacity and coverage. The uptake of unlicensed band use has been so great that in many areas additional unlicensed spectrum is needed to further expand service offerings and relieve congestion. While the number of unlicensed wireless devices has increased by tens of thousands of percentages over the past decade, the amount of spectrum allocated for their use has remained static. Thus, a clear challenge for the future is to ensure that ample unlicensed spectrum is made available to meet growing consumer demand. Current trends project that the number of unlicensed wireless devices will continue to increase at double-digit yearly growth rates. Without additional spectrum space, urban centers may find that the overcrowding of unlicensed bands will reach unprecedented levels in the coming years, thus dramatically lowering the utility of these frequencies.

The 2010 U.S. National Broadband Plan proposed the allocation of a new nationwide contiguous unlicensed band, although it did not specify where or how much spectrum would be made available.⁸⁹ Unfortunately, the lure of revenues from spectrum auctions, particularly given the new focus in Congress on fiscal austerity, may make it considerably more difficult to see another allocation for unlicensed. Even so, in the past there has been a limited constituency pushing for greater unlicensed access to spectrum. Given the promise of unlicensed access for supporting the development of local and community networks that can prioritize civic uses such as locally produced news, journalism, and media, advocates of those efforts must increasingly weigh in on spectrum allocation decisions to ensure greater public access to the airwaves through expanding the amount of spectrum available on an unlicensed basis.

Thus, we recommend specifically:

- Increasing the amount of spectrum available

for citizen access through allocating a new nationwide unlicensed band by authorized devices.

Opportunistic (Re)use of Spectrum: Allowing Devices to Opportunistically Identify Unused Frequencies and Transmit⁹⁰

The biggest challenge for opening up new spectrum for unlicensed citizen access is the difficulty of reallocating current spectrum that has already been licensed and is either completely unused or only used on a sporadic basis. For example, throughout the spectrum allocated for over-the-air television broadcasting there are a significant number of unused channels, particularly in rural areas. Or in the case of spectrum allocated for Federal uses such as the Forest Service, the spectrum may only be utilized in times of emergency (i.e. a forest fire) but otherwise lay completely fallow.

Advances in smart or cognitive radio (CR) and software defined radio (SDR) technologies have fundamentally expanded the options available for to increase unlicensed access and allocation. Traditionally, the spectrum scarcity rationale has led to difficulties in finding frequencies to support wireless broadband Internet. However, technological advances have created opportunities for dynamic spectrum sharing, thus potentially ending the persistent problem of artificial scarcity of spectrum.⁹¹ This especially holds true for use within vacant or unused spectrum, often referred to as “white spaces,” where cognitive radios, could rapidly scan and process spectrum use in real time, identify unused frequencies, and utilize these frequencies rather than leaving them fallow.⁹² By opportunistically occupying unused frequencies within specific bands, these devices are far more efficient than traditional “dumb” technologies, which often broadcast on a single frequency regardless of other users or potential congestion.

In November 2008, the FCC opened vacant television channels to unlicensed white space devices.⁹³ These devices are required to employ spectrum-sensing technologies and a geo-locational database to automatically detect occupied television frequencies and other protected users in the band.⁹⁴ The technologies allow white space devices (WSDs) to identify and use the unassigned frequencies that exist between broadcast television channels and outside the coverage areas of licensed broadcasters for digital communications, including broadband networks. While civilian use of WSD technology and devices was only recently permitted, the military has been testing similar WSD technology for years and has run numerous tests demonstrating its feasibility as a part of the DARPA XG project.⁹⁵

“Opportunistic access to spectrum offers the potential to significantly expand unlicensed, citizen access and ensure that all sectors within a democratic society have access to the valuable public airwaves.”

Beyond the TV white spaces, the geo-locational databases that are expected for the TV white spaces could be expanded to include other underused licensed frequencies, including federal spectrum. Federal spectrum sharing through opportunistic access offers a more feasible approach to accessing valuable federal spectrum bands than clearing and auctioning. Through this approach, federal spectrum users could maintain access to frequencies when they need them, such as in times of emergency, while ensuring public access when these frequencies would otherwise be idle. Moreover, as previously discussed, mobile licensees could be subject to a “use it or share it” condition, enabling the public and other competitive providers to use spectrum in areas where the licensee has failed to build-out service. Such sharing could be accomplished through an active system like the aforementioned database or passively through sensing such as in 5470-5725 MHz (the so-called 5 GHz Wi-Fi band)

where devices must vacate frequencies if they detect military radar signals.⁹⁶

Opportunistic access could also potentially enable dynamic and real-time pricing for spectrum use. In particular, if congestion (i.e. too many users or devices are operating on the same frequencies and result in a substantial degradation in the speed and quality of communications) becomes an issue after widespread implementation of opportunistic access, dynamic pricing in the form of micropayments could act as a sort of congestion pricing.

However, it is worth noting that there are a number of considerable challenges to overcome in order to employ dynamic pricing. These include the development of an infrastructure that would allow mobile devices to communicate with a licensee or regulator, request the right to use the spectrum, and agree on a real-time price, including mechanisms for authentication, transferring payments, and monitoring use. Transaction costs remain a considerable obstacle for the implementation of the model and must be less than the value of the spectrum to lessors for this model to work.⁹⁷ It is equally important that the transactions need to be completed in a matter of milliseconds to limit latency on the network.

Furthermore, given that mobile carriers are increasingly using WiFi technologies to offload mobile broadband traffic in urban areas on the same “junk bands” that home routers, microwaves, and baby monitors use, it is unclear to what extent congestion will be a concern in the future.⁹⁸ Also, current and future technology advances (e.g. frequency hopping and cooperative networking) could make even more efficient use of spectrum on an opportunistic basis.⁹⁹

Opportunistic access to spectrum offers the potential to significantly expand unlicensed, citizen access and ensure that all sectors within a democratic society have access to the valuable public airwaves. This innovation will only be possible if policymakers

actively seek to create space for the technology to flourish and grow.

Thus, we recommend specifically:

- Ensuring the availability of TV white space on a nationwide basis, even if there is an auction of spectrum in the TV band.
- Expanding the geo-locational database and technology currently being developed for the TV White Spaces into other unused or underutilized spectrum bands including those currently allocated to Federal users.
- Supporting the development of other “smart” radio technologies, such as devices that can detect unused frequencies through sensing alone and allow for their use on unused or underutilized spectrum.

Conclusion

The nation is at a tenuous crossroads in its approach to communications, news, journalism, and free speech. Today, communications technologies are rapidly changing, allowing for expanded opportunities for media and journalism, innovative models for public media, and the great potential for the wide-scale participation of the public in the news gathering and production process. At the same time, the nation’s traditional journalism infrastructure is quickly crumbling, while the convergence of all forms of media onto broadband is coinciding with a rapid increase in demand for spectrum necessary to facilitate mobile broadband. Without substantial policy changes, there is a considerable risk of further cementing a small group of powerful commercial gatekeepers over the nation’s media and information infrastructure.

The outcome can be avoided, but only through expanding our thinking around spectrum policy, broadcasting, and public media. Today, many policies concerning media and communications still reflect mid-20th century technological reality and thinking. As demand for broadband grows and

spectrum continues to outpace current assignment methods, regulators must broaden their spectrum thinking, and maintain a focus on ensuring access to public interest content and supporting public discourse. This will require the FCC, the NTIA, and the nation’s elected policymakers to explore much-needed reforms to create a more dynamic spectrum ecosystem that is better tailored to meet the wireless needs of not just current large mobile providers and technologies, but also new competitors, business models, and public media.

As Nuechterlein and Weiser suggest, “Just as the First Amendment bars the government from limiting who can own a printing press...it might well bar the government from restricting access to the airwaves as a medium of communication in the hypothesized world of super-abundant spectrum.”¹⁰⁰ These arguments for expanded public access to the public’s airwaves will only continue to proliferate as arguments for maintaining an outdated status quo—to the benefit of a small group of incumbent users and to the detriment of innovation and the general public—become less and less tenable.¹⁰¹ The clear lesson to learn from the current environment is that an overreliance on behavioral regulations and/or traditionally used auction approaches will not suffice in maximizing the public benefit or meeting public policy goals.

In the United States, new approaches to spectrum access could contribute to the regeneration of public media in the 21st century. This will require a diverse set of policymakers to approach the establishment of a new bargain between broadcasters, mobile network providers and the public. The challenge of achieving such a multifaceted set of changes with respect to spectrum policy must not be underestimated. It will require a strong coalition of advocates in DC and around the country, policy experts, industry players and public broadcasters alongside significant public engagement of those who care about 21st century media. Without strong engagement from this community, the nuanced

and complex tradeoffs outlined above will likely be lost in the multistep process of drafting of any bill or subsequent regulation. The forward looking policies we have outlined will not be easy to achieve.

“In the United States, new approaches to spectrum access could contribute to the regeneration of public media in the 21st Century.”

The benefits of the right bargain cannot be underestimated. It could allocate spectrum appropriately for those broadcasters who still need it, move beyond outmoded and ineffective public interest obligations to create substantial funding for an expanded and diverse public media, and support an array of rising news producers and creators on multiple communications platforms. Most importantly, the right bargain could provide open citizen and community access to the airwaves such that they will be not only be able to participate in the production of public media, but also create their own media infrastructure. Ultimately, this would leave the United States with a revitalized public space to meet the civil, information, and journalism needs of the 21st century.

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MAIN OFFICE

1899 L Street, NW
Suite 400
Washington, DC 20036
Phone 202 986 2700
Fax 202 986 3696

CALIFORNIA OFFICE

921 11th Street
Suite 901
Sacramento, CA 95814
Phone 916 448 5189



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